

Contents of *Aquaculture*, Volume 256

VOL. 256 NOS. 1–4

15 June 2006

Review Article

Bivalve genomics

- C. Saavedra (Castellón, Spain) and E. Bachère (Montpellier Cedex 5, France) 1

Diseases

Immunological consequences of the coinfection of brown trout (*Salmo trutta*) with infectious hematopoietic necrosis virus (IHNV) and infectious pancreatic necrosis virus (IPNV)

- C. Tafalla (Valdeolmos Madrid, Spain), S. Rodríguez Saint-Jean and S. Pérez-Prieto (Madrid, Spain) 15

Organ distribution of red sea bream iridovirus (RSIV) DNA in asymptomatic yearling and fingerling rock bream (*Oplegnathus fasciatus*) and effects of water temperature on transition of RSIV into acute phase

- S. Kyung Choi, S. Ryun Kwon, Y. Kwon Nam, S. Koo Kim and K. Hong Kim (Pusan, Republic of Korea) 23

Geometric quantification of lordosis effects on body shape in European sea bass, *Dicentrarchus labrax* (Linnaeus, 1758)

- D.G. Sfakianakis (Crete, Greece), E. Georgakopoulou (Rio, Greece), M. Kentouri (Crete, Greece) and G. Koumoundouros (Greece) 27

Variability in the tandem repetitive DNA sequences of white spot syndrome virus (WSSV) genome and suitability of VP28 gene to detect different isolates of WSSV from India

- S. Syed Musthaq, R. Sudhakaran, V.P. Ishaq Ahmed, G. Balasubramanian and A.S. Sahul Hameed (Tamil Nadu, India) 34

Effects of disease risk, vaccine efficacy, and market price on the economics of fish vaccination

- R. Thorarinnsson (Oslo, Norway) and D.B. Powell (Redmond, WA, USA) 42

Bacterial diversity in a marine hatchery: Balance between pathogenic and potentially probiotic bacterial strains

- A.D. Schulze (Nanaimo, B.C., Canada), A.O. Alabi, A.R. Tattersall-Sheldrake (Lantzville, B.C., Canada) and K.M. Miller (Nanaimo, B.C., Canada) 50

Effects of (*Margaritifera margaritifera*) glochidial infection on performance of tank-reared Atlantic salmon (*Salmo salar*)

- J.W. Treasurer (Argyll, UK), L.C. Hastie (Aberdeen, UK), D. Hunter, F. Duncan and C.M. Treasurer (Fort William, UK) 74

Haematological changes in the three Indian major carps, *Catla catla* (Hamilton), *Labeo rohita* (Hamilton) and *Cirrhinus mrigala* (Hamilton) exposed to acidic and alkaline water pH

- P.C. Das (Orissa, India), S. Ayyappan (New Delhi, India) and J.K. Jena (Orissa, India) 80

Immune response of great sturgeon (*Huso huso*) subjected to long-term exposure to sublethal concentration of the organophosphate, diazinon

- H.A. Khoshbavar-Rostami (Sari, Iran), M. Soltani (Tehran, Iran) and H.M.D. Hassan (Kualalumpur, Malaysia) 88

Possible role of a plasmid in the pathogenesis of a fish disease caused by *Aeromonas hydrophila*

- T. Majumdar, S. Ghosh (Santiniketan, India), J. Pal (India) and S. Mazumder (Santiniketan, India) 95

Characterization of *Streptococcus iniae* isolated from ornamental cyprinid fishes and development of challenge models

- R. Russo (Ruskin, Florida, USA), H. Mitchell and R.P.E. Yanong (Bothell, Washington, USA) 105

Quantitative assessment of apoptotic hemocytes in white spot syndrome virus (WSSV)-infected penaeid shrimp, *Penaeus monodon* and *Penaeus indicus*, by flow cytometric analysis

- A.S. Sahul Hameed, M. Sarathi, R. Sudhakaran, G. Balasubramanian and S. Syed Musthaq (Vellore, India) 111

Pharmacokinetics and tissue residues of difloxacin in crucian carp (*Carassius auratus*) after oral administration

- F. Ding, J. Cao, L. Ma, Q. Pan, Z. Fang and X. Lu (Wuhan, PR China) 121

Contents of *Aquaculture*, Volume 256

VOL. 256 NOS. 1–4

15 June 2006

Review Article

Bivalve genomics

- C. Saavedra (Castellón, Spain) and E. Bachère (Montpellier Cedex 5, France) 1

Diseases

Immunological consequences of the coinfection of brown trout (*Salmo trutta*) with infectious hematopoietic necrosis virus (IHNV) and infectious pancreatic necrosis virus (IPNV)

- C. Tafalla (Valdeolmos Madrid, Spain), S. Rodríguez Saint-Jean and S. Pérez-Prieto (Madrid, Spain) 15

Organ distribution of red sea bream iridovirus (RSIV) DNA in asymptomatic yearling and fingerling rock bream (*Oplegnathus fasciatus*) and effects of water temperature on transition of RSIV into acute phase

- S. Kyung Choi, S. Ryun Kwon, Y. Kwon Nam, S. Koo Kim and K. Hong Kim (Pusan, Republic of Korea) 23

Geometric quantification of lordosis effects on body shape in European sea bass, *Dicentrarchus labrax* (Linnaeus, 1758)

- D.G. Sfakianakis (Crete, Greece), E. Georgakopoulou (Rio, Greece), M. Kentouri (Crete, Greece) and G. Koumoundouros (Greece) 27

Variability in the tandem repetitive DNA sequences of white spot syndrome virus (WSSV) genome and suitability of VP28 gene to detect different isolates of WSSV from India

- S. Syed Musthaq, R. Sudhakaran, V.P. Ishaq Ahmed, G. Balasubramanian and A.S. Sahul Hameed (Tamil Nadu, India) 34

Effects of disease risk, vaccine efficacy, and market price on the economics of fish vaccination

- R. Thorarinnsson (Oslo, Norway) and D.B. Powell (Redmond, WA, USA) 42

Bacterial diversity in a marine hatchery: Balance between pathogenic and potentially probiotic bacterial strains

- A.D. Schulze (Nanaimo, B.C., Canada), A.O. Alabi, A.R. Tattersall-Sheldrake (Lantzville, B.C., Canada) and K.M. Miller (Nanaimo, B.C., Canada) 50

Effects of (*Margaritifera margaritifera*) glochidial infection on performance of tank-reared Atlantic salmon (*Salmo salar*)

- J.W. Treasurer (Argyll, UK), L.C. Hastie (Aberdeen, UK), D. Hunter, F. Duncan and C.M. Treasurer (Fort William, UK) 74

Haematological changes in the three Indian major carps, *Catla catla* (Hamilton), *Labeo rohita* (Hamilton) and *Cirrhinus mrigala* (Hamilton) exposed to acidic and alkaline water pH

- P.C. Das (Orissa, India), S. Ayyappan (New Delhi, India) and J.K. Jena (Orissa, India) 80

Immune response of great sturgeon (*Huso huso*) subjected to long-term exposure to sublethal concentration of the organophosphate, diazinon

- H.A. Khoshbavar-Rostami (Sari, Iran), M. Soltani (Tehran, Iran) and H.M.D. Hassan (Kualalumpur, Malaysia) 88

Possible role of a plasmid in the pathogenesis of a fish disease caused by *Aeromonas hydrophila*

- T. Majumdar, S. Ghosh (Santiniketan, India), J. Pal (India) and S. Mazumder (Santiniketan, India) 95

Characterization of *Streptococcus iniae* isolated from ornamental cyprinid fishes and development of challenge models

- R. Russo (Ruskin, Florida, USA), H. Mitchell and R.P.E. Yanong (Bothell, Washington, USA) 105

Quantitative assessment of apoptotic hemocytes in white spot syndrome virus (WSSV)-infected penaeid shrimp, *Penaeus monodon* and *Penaeus indicus*, by flow cytometric analysis

- A.S. Sahul Hameed, M. Sarathi, R. Sudhakaran, G. Balasubramanian and S. Syed Musthaq (Vellore, India) 111

Pharmacokinetics and tissue residues of difloxacin in crucian carp (*Carassius auratus*) after oral administration

- F. Ding, J. Cao, L. Ma, Q. Pan, Z. Fang and X. Lu (Wuhan, PR China) 121

Genetics

EST-based identification of genes expressed in the hypothalamus of male orange-spotted grouper (<i>Epinephelus coioides</i>) L. Zhou, B. Yao, W. Xia, C.-J. Li, Y. Wang, Y.-H. Shi and J.-F. Gui (Wuhan, China)	129
Context dependent differences in growth of two rainbow trout (<i>Oncorhynchus mykiss</i>) lines selected for divergent stress responsiveness T.G. Pottinger (Lancaster, United Kingdom)	140
Mating systems and male reproductive success in Nile tilapia (<i>Oreochromis niloticus</i>) in breeding hapas: A microsatellite analysis Y. Fessehaye (Wageningen, The Netherlands; Sharkia, Egypt), Z. El-bialy (Wageningen, The Netherlands), M.A. Rezk (Sharkia, Egypt), R. Crooijmans, H. Bovenhuis and H. Komen (Wageningen, The Netherlands)	148
Development of a microsatellite multiplex PCR for Senegalese sole (<i>Solea senegalensis</i>) and its application to broodstock management J. Porta, J. Maria Porta (Málaga, Spain), G. Martinez-Rodriguez (Cádiz, Spain) and M. del Carmen Alvarez (Málaga, Spain)	159
Genetic analyses of Asian seabass stocks using novel polymorphic microsatellites Ze Yuan Zhu, G. Lin, Loong Chueng Lo, Yin Xue Xu, F. Feng, R. Chou and Gen Hua Yue (Singapore)	167

Husbandry and Management

An evaluation of stocking density on the intensive production of juvenile brown tiger shrimp (<i>Penaeus esculentus</i>) S.J. Arnold, M.J. Sellars, P.J. Crocos and G.J. Coman (Queensland, Australia)	174
Developmental stages and potential mariculture for coastal rehabilitation of endangered Pacific angelwing clam, <i>Pholas orientalis</i> J.D. Ronquillo (British Columbia, Canada; Iloilo, Philippines) and R. Scott McKinley (British Columbia, Canada)	180
Effects of temperature and delayed initial feeding on the growth of Malabar grouper (<i>Epinephelus malabaricus</i>) larvae K. Yoseda, S. Dan (Okinawa, Japan), T. Sugaya (Ooita, Japan), K. Yokogi, M. Tanaka (Kyoto, Japan) and S. Tawada (Okinawa, Japan)	192
Mariculture of <i>Hypnea musciformis</i> (Wulfen) Lamouroux in South east coast of India M. Ganesan, S. Thirupathi (Tamilnadu, India) and B. Jha (Gujarat, India)	201
Advanced nursing of <i>Clarias gariepinus</i> (Burchell, 1822) fingerlings in earthen ponds, through recycling of tilapia recruits S. Yong-Sulem, L. Tchanchou, F. Nguefack (Foumban, Cameroon) and R.E. Brummett (Yaounde, Cameroon)	212
Photoperiod can be used to enhance growth and improve feeding efficiency in farmed rainbow trout, <i>Oncorhynchus mykiss</i> J.F. Taylor, B.P. North (Scotland, UK), M.J.R. Porter (Tasmania, Australia), N.R. Bromage and H. Migaud (Scotland, UK)	216
Laboratory simulation of the effects of environmental salinity on acclimation, feeding and growth of wild-caught juveniles of European sea bass <i>Dicentrarchus labrax</i> and gilthead sea bream, <i>Sparus aurata</i> A.J. Conides (Athens, Greece) and B. Glamuzina (Dubrovnik, Croatia)	235
Reduction of land based fish-farming impact by phytotreatment pond system in a marginal lagoon area P. Gennaro, M. Guidotti, E. Funari, S. Porrello (Rome, Italy) and M. Lenzi (Orbetello, Italy)	246
Effects of water reuse and stocking density on water quality, blood physiology and growth rate of juvenile cod (<i>Gadus morhua</i>) A. Foss (Bergen, Norway), T. Kristensen (Oslo, Norway), Å. Åtland (Bergen, Norway), H. Hustveit (Sogndal, Norway), H. Hovland, A. Øfsti (Flora, Norway) and A.K. Imsland (Kópavogur, Iceland; Bergen, Norway)	255
Cryopreservation of yamú (<i>Brycon amazonicus</i>) sperm for large scale fertilization Y.M. Velasco-Santamaria, V.M. Medina-Robles and P.E. Cruz-Casallas (Meta, Colombia)	264
Remote estimation of chlorophyll concentration in hyper-eutrophic aquatic systems: Model tuning and accuracy optimization P.V. Zimba (Stoneville, MS, USA) and A. Gitelson (Lincoln, NE, USA)	272
Changes in microbial communities associated with the conditioning of filter material in recirculating aquaculture systems of the pufferfish <i>Takifugu rubripes</i> S. Itoi, A. Niki and H. Sugita (Kanagawa, Japan)	287
The relationship between ultraviolet and polarized light and growth rate in the early larval stages of turbot (<i>Scophthalmus maximus</i>), Atlantic cod (<i>Gadus morhua</i>) and Atlantic herring (<i>Clupea harengus</i>) reared in intensive culture conditions H.I. Browman, A.B. Skiftesvik and P. Kuhn (Storebø, Norway)	296
Monitoring nutrient release from fish farms with macroalgal and phytoplankton bioassays T. Dalsgaard and D. Krause-Jensen (Silkeborg, Denmark)	302
Fatty acid composition of the common octopus, <i>Octopus vulgaris</i> , in relation to rearing temperature and body weight H. Miliou, M. Fintikaki, M. Tzitzinakis, T. Kountouris and G. Verriopoulos (Athens, Greece)	311
Muscle and flesh quality traits in wild and farmed Atlantic salmon I.A. Johnston, X. Li, V.L.A. Vieira (Scotland, UK), D. Nickell (Kaiseraugst, Switzerland), A. Dingwall, R. Alderson, P. Campbell and R. Bickerdike (Scotland, UK)	323
Production of triploid Kuruma shrimp, <i>Marsupenaeus (Penaeus) japonicus</i> (Bate) nauplii through inhibition of polar body I, or polar body I and II extrusion using 6-dimethylaminopurine M.J. Sellars (Cleveland, Brisbane, Qld, Australia), B.M. Degnan (Brisbane, Qld, Australia) and N.P. Preston (Cleveland, Qld, Australia)	337

Nutrition

Effects of diets on the growth of the brackish water cyclopoid copepod <i>Paracyclopina nana</i> Smirnov K.W. Lee (Ansan, Korea), H.G. Park, S.-M. Lee (Gangneung, South Korea) and H.-K. Kang (Ansan, Korea)	346
Comparison of white flakes and toasted soybean meal partly replacing fish meal as protein source in extruded feed for rainbow trout (<i>Oncorhynchus mykiss</i>) O.H. Romarheim, A. Skrede (CoE, Ås, Norway), Y. Gao (Ås, Norway; Ningbo, PR China), Å. Krogdahl (CoE, Oslo, Norway), V. Denstadli (CoE, Ås, Norway), E. Lilleeng (CoE, Oslo, Norway) and T. Storebakken (CoE, Ås, Norway)	354
Feed intake, growth, feed conversion, digestibility, enzyme activities and intestinal structure in Atlantic salmon (<i>Salmo salar</i> L.) fed graded levels of phytic acid V. Denstadli, A. Skrede (CoE, Ås, Norway), Å. Krogdahl (CoE, Oslo, Norway), S. Sahlström (Ås, Norway) and T. Storebakken (CoE, Ås, Norway)	365
Influence of phytoplankton diet mixtures on microalgae consumption, larval development and settlement of the Pacific oyster <i>Crassostrea gigas</i> (Thunberg) B. Rico-Villa, J.R. Le Coz, C. Mingant and R. Robert (Landunvez, France)	377
Dietary glutamine supplementation improves structure and function of intestine of juvenile Jian carp (<i>Cyprinus carpio</i> var. Jian) L. Yan and X. Qiu-Zhou (China)	389
Effect of the dietary essential to non-essential amino acid ratio on growth, feed utilization and nitrogen metabolism of European sea bass (<i>Dicentrarchus labrax</i>) H. Peres and A. Oliva-Teles (Porto, Portugal)	395
The effects of feeding with shrimp or fish fry on growth and mantle lipid composition of juvenile and adult cuttlefish (<i>Sepia officinalis</i>) E. Almansa (Huelva, Spain), P. Domingues (Huelva, Spain; Faro, Portugal), A. Sykes (Faro, Portugal; Canary Islands, Spain), N. Tejera, A. Lorenzo (Canary Islands, Spain) and J.P. Andrade (Faro, Portugal)	403
Partial replacement of red crab (<i>Pleuroncodes planipes</i>) meal for fish meal in practical diets for the white shrimp <i>Litopenaeus vannamei</i> . Effects on growth and in vivo digestibility E. Goytortúa-Bores, R. Civera-Cerecedo, S. Rocha-Meza and A. Green-Yee (La Paz, B.C.S., México)	414

Physiology and Endocrinology

Effects of sex steroids on spawning in the sea scallop, <i>Placopecten magellanicus</i> C. Wang and R.P. Croll (Nova Scotia, Canada)	423
In vivo biological activity of recombinant goldfish gonadotropins produced by baculovirus in silkworm larvae M. Kobayashi, T. Morita, K. Ikeguchi, G. Yoshizaki (Tokyo, Japan), T. Suzuki (Saitama, Japan) and S. Watabe (Tokyo, Japan)	433
Permanent sex inversion in 1-year-old juveniles of the protogynous dusky grouper (<i>Epinephelus marginatus</i>) using controlled-release 17 α -methyltestosterone implants K. Sarter (Crete, Greece; Heidelberg, Germany), M. Papadaki (Crete, Greece), S. Zanuy (Castellón, Spain) and C.C. Mylonas (Crete, Greece)	443
The influence of diets containing dried bivalve feces and/or powdered algae on growth and energy distribution in sea cucumber <i>Apostichopus japonicus</i> (Selenka) (Echinodermata: Holothuroidea) X. Yuan (Qingdao, Dalian, P.R. China), H. Yang, Y. Zhou, Y. Mao, T. Zhang and Y. Liu (Qingdao, P.R. China)	457
A novel two-step procedure for mass production of all-male populations of the giant freshwater prawn <i>Macrobrachium rosenbergii</i> E.D. Afalo (Beer-Sheva, Israel), T.T.T. Hoang, V.H. Nguyen, Q. Lam, D.M. Nguyen, Q.S. Trinh (Ho Chi Minh City, Vietnam), S. Raviv and A. Sagi (Beer-Sheva, Israel)	468
Ontogenetic development of the proteolytic digestion activities in larvae of <i>Oreochromis niloticus</i> fed with different diets A. Drossou, B. Uebeschär (Kiel, Germany), H. Rosenthal and K.-H. Herzig (Kiel, Germany; Finland)	479
Ontogenetic development of the digestive system in yellowtail kingfish <i>Seriola lalandi</i> larvae B.N. Chen, J.G. Qin (Adelaide, SA, Australia), M.S. Kumar, W. Hutchinson and S. Clarke (Henley Beach, SA, Australia)	489
Effects of water temperature and air exposure on the lysosomal membrane stability of hemocytes in Pacific oysters, <i>Crassostrea gigas</i> (Thunberg) Z. Zhang (Dalian, PR China), X. Li, M. Vandepuer (West Beach, Australia) and W. Zhao (Dalian, PR China)	502
Feeding and growth on bivalve biodeposits by the deposit feeder <i>Stichopus japonicus</i> Selenka (Echinodermata: Holothuroidea) co-cultured in lantern nets Y. Zhou, H. Yang, S. Liu, X. Yuan, Y. Mao, Y. Liu, X. Xu and F. Zhang (Qingdao, People's Republic of China)	510
Use of salt during transportation of air breathing pirarucu juveniles (<i>Arapaima gigas</i>) in plastic bags L.C. Gomes, E.C. Chagas (Manaus, AM, Brazil), R.P. Brinn (Miami, FL, USA), R. Roubach (Manaus, AM, Brazil), C.E. Coppati and B. Baldisserotto (Santa Maria, RS, Brazil)	521
The influence of temperatures ranging from 25 to 36 °C on developmental rates, morphometrics and survival of freshwater prawn (<i>Macrobrachium rosenbergii</i>) embryos S.M. Manush, A.K. Pal, T. Das and S.C. Mukherjee (Mumbai, India)	529

Evaluation of the effects of grading and starvation on the lysosomal membrane stability in pacific oysters, <i>Crassostrea gigas</i> (Thunberg) by using neutral red retention assay Z. Zhang (Dalian, PR China) and X. Li (West Beach, SA, Australia)	537
Oxygen consumption and ventilatory frequency responses to gradual hypoxia in common dentex (<i>Dentex dentex</i>): Basis for suitable oxygen level estimations J. Cerezo Valverde, F.-J. Martínez López and B. García García (Murcia, Spain)	542
Effect of supplemental L-ascorbyl-2-polyphosphate (APP) in enriched live food on the immune response of <i>Penaeus vannamei</i> exposed to ammonia-N W.-N. Wang (Guangzhou, PR China), Y. Wang (Baoding, PR China) and A.-L. Wang (Guangzhou, PR China)	552
Effect of dietary higher level of selenium and nitrite concentration on the cellular defense response of <i>Penaeus vannamei</i> W.-N. Wang, A.-L. Wang (Guangzhou, PR China) and Y.-J. Zhang (Baoding, PR China)	558
Cryopreservation of semen from the endangered Caspian brown trout (<i>Salmo trutta caspius</i>) K. Sarvi, H. Niksirat, B. Mojazi Amiri, S.M. Mirtorabi, G.R. Rafiee and M. Bakhtiyari (Karaj, Iran)	564
Comparative analysis of growth performance and sperm motility between precocious and non-precocious males in the European sea bass (<i>Dicentrarchus labrax</i> , L.) A. Felip, S. Zanuy and M. Carrillo (Castellón, Spain)	570
The effects of body weight, temperature, salinity, pH, light intensity and feeding condition on lethal DO levels of whiteleg shrimp, <i>Litopenaeus vannamei</i> (Boone, 1931) P. Zhang, X. Zhang, J. Li and G. Huang (Qingdao, PR China)	579
The relationship between individual differences in feed efficiency and stress response in African catfish <i>Clarias gariepinus</i> C.I.M. Martins, J.W. Schrama and J.A.J. Verreth (Wageningen, The Netherlands)	588
Effects of food, temperature and light intensity on the feeding behavior of three-spot juvenile seahorses, <i>Hippocampus trimaculatus</i> Leach J. Sheng, Q. Lin, Q. Chen, Y. Gao, L. Shen and J. Lu (Guangzhou, the People's Republic of China)	596
The effects of dissolved oxygen concentration and stocking density on growth and non-specific immunity factors in Chinese shrimp, <i>Fenneropenaeus chinensis</i> Y. Li, J. Li and Q. Wang (Qingdao, PR China)	608
Comparative studies on fatty acid composition of the ovaries and hepatopancreas at different physiological stages of the Chinese mitten crab X.-P. Ying (Wenzhou, China), W.-X. Yang (Zhejiang, China) and Y.-P. Zhang (Wenzhou, China)	617
Short Communications	
Effects of temperature on growth, adenosine phosphates, ATPase and cellular defense response of juvenile shrimp <i>Macrobrachium nipponense</i> W.-N. Wang, A.-L. Wang, Y. Liu (Guangzhou, PR China), J. Xiu, Z.-B. Liu (Baoding, PR China) and R.-Y. Sun (Guangzhou, PR China)	624
Cloning and expression analysis of the co-receptor CD8 α in sea bream (<i>Sparus aurata</i> L.) E. Randelli, A. Foglietta, M. Mazzini, G. Scapigliati and F. Buonocore (Viterbo, Italy)	631
Contents of Aquaculture, Volume 256	638